

## Claims

We claim:

- 1 1. A method for processing video source frames, comprising:
  - 2 providing a video processing system (VPS) that includes a processor, a memory structure,
  - 3 and a video input device, wherein the processor is coupled to the memory structure and to the
  - 4 video input device;
  - 5 inputting video source frames from a video source into the VPS through the video input
  - 6 device;
  - 7 executing the video source frames, by the processor;
  - 8 dynamically and non-contiguously extracting key frames from the video source frames
  - 9 during the executing, said extracting implemented in accordance with a frame extraction
  - 10 algorithm that is stored in the memory structure and executed by the processor;
  - 11 storing the extracted key frames in a first memory of the memory structure; and
  - 12 terminating extracting key frames, prior to completion of said executing of the video
  - 13 source frames.

- 1 2. The method of claim 1, wherein the first memory includes a temporary memory.
- 1 3. The method of claim 2, wherein the temporary memory includes a random access memory
- 2 (RAM).

1 4. The method of claim 1, wherein the first memory includes a permanent memory.

1 5. The method of claim 4, wherein the permanent memory includes hard disk memory.

1 6. The method of claim 1, further comprising recording in the first memory an indication of a  
2 video source frame being executed when the terminating occurred.

1 7. The method of claim 6, wherein recording in the first memory comprises generating a special  
key frame that includes the indication, and further comprising appending the special key frame to  
the extracted key frames in the first memory.

1 8. The method of claim 1, wherein the terminating is triggered by action of a user of the VPS.

1 9. The method of claim 8, wherein the action includes a manipulating by the user of a user input  
2 device.

1 10. The method of claim 1, wherein the terminating occurs at a time when a predetermined  
2 condition has occurred.

1 11. The method of claim 10, wherein the predetermined condition includes execution of a  
2 predetermined fraction or percentage of the video source frames.

1       12. The method of claim 10, wherein the predetermined condition includes execution of a  
2       predetermined number of video source frames.

1       13. The method of claim 10, wherein the predetermined condition includes an elapsing of  
2       predetermined time duration from initiation of executing the video source frames.

1       14. The method of claim 1, further comprising reviewing the key frames by a user of the VPS,  
2       wherein the reviewing occurs through an output display that is coupled to the processor.

1       15. The method of claim 14, wherein the output display includes a television screen or a  
2       computer monitor.

1       16. The method of claim 14, wherein the reviewing occurs prior to completion of executing the  
2       video source frames.

1       17. The method of claim 16, wherein the reviewing occurs at or after the terminating.

1       18. The method of claim 16, wherein the reviewing occurs prior to the terminating.

1       19. The method of claim 14, wherein the reviewing occurs at or after completion of executing  
2       the video source frames.

1       20. The method of claim 14, further comprising at or after completion of the reviewing, erasing  
2       the key frames from the first memory.

1       21. The method of claim 20, wherein the erasing is triggered by action of the user.

1       22. The method of claim 21, wherein the action includes a manipulating by the user of a user  
2       input device.

1       23. The method of claim 20, wherein the erasing occurs at a time when a predetermined  
2       condition has occurred.

1       24. The method of claim 23, wherein the predetermined condition includes completion of the  
2       executing of the video source frames.

1       25. The method of claim 23, wherein the predetermined condition includes an elapse of a  
2       predetermined amount of time following the reviewing.

1       26. The method of claim 14, further comprising after completion of the reviewing, copying the  
2       key frames from the first memory to a second memory of the memory structure, wherein the  
3       second memory includes a removable memory.

1       27. The method of claim 26, further comprising after completion of the copying, erasing the key

2 frames from the first memory.

1 28. The method of claim 1, wherein the video frame extraction algorithm comprises a content-  
2 based method of video frame extraction.

1 29. The method of claim 28, wherein the content-based method includes a keyframe scene  
2 detection method selected from the group consisting of a Method One keyframe scene detection  
3 method, a Method Two keyframe scene detection method, a Method Three keyframe scene  
4 detection method, and a Method Four keyframe scene detection method.

30. The method of claim 1, wherein the video frame extraction algorithm comprises a content-  
independent method of video frame extraction.

1 31. A system for processing video frames, comprising:

2       a video frame extraction algorithm that dynamically and non-contiguously extracts key

3       frames from the video source frames during execution of the video source frames;

4       a processor that executes the video source frames and executes the video frame extraction

5       algorithm;

6       a video input device that receives the video source frames from a video source, wherein

7       the video input device is coupled to the processor;

8       a memory structure coupled to the processor, wherein the memory structure stores the

9       video frame extraction algorithm, and wherein a first memory of the memory structure stores the

10       extracted key frames; and

11       a terminating mechanism that terminates extraction of the key frames prior to completion

12       of execution of the video source frames.

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14 32. The system of claim 31, wherein the first memory includes a temporary memory.

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16 33. The system of claim 32, wherein the temporary memory includes a random access memory

17       (RAM).

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19 34. The system of claim 31, wherein the first memory includes a permanent memory.

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21 35. The system of claim 34, wherein the permanent memory includes hard disk memory.

1       36. The system of claim 31, further comprising a recording mechanism that records in the first  
2       memory an indication of a video source frame being executed when the extraction of key frames  
3       is terminated.

1       37. The system of claim 36, wherein the recording mechanism records the indication in a special  
2       key frame that is appended to the extracted key frames.

1       38. The system of claim 31, wherein the terminating mechanism includes a user-controlled  
2       device.

1       39. The system of claim 38, wherein the user-controlled device includes a user input device that  
2       is coupled to the processor.

1       40. The system of claim 31, wherein the terminating mechanism terminates the extracting at a  
2       time when a predetermined condition has occurred.

1       41. The system of claim 40, wherein the predetermined condition includes execution of a  
2       predetermined fraction or percentage of the video source frames.

1       42. The system of claim 40, wherein the predetermined condition includes execution of a  
2       predetermined number of video source frames.

1 43. The system of claim 40, wherein the predetermined condition includes an elapsing of  
2 predetermined time duration from initiation of the execution of the video source frames.

1 44. The system of claim 31, further comprising an output display through which a user may  
2 review the extracted key frames, wherein the output display is coupled to the processor.

1 45. The system of claim 44, wherein the output display includes a television screen or a  
2 computer monitor.

1 46. The system of claim 44, wherein the system permits review of the key frames prior to  
2 completion of execution of the video source frames.

1 47. The system of claim 46, wherein the system permits review of the key frames when or after  
2 the terminating mechanism terminates extracting the key frames.

1 48. The system of claim 46, wherein the system permits review of the key frames before the  
2 terminating mechanism terminates extracting the key frames.

1 49. The system of claim 44, wherein the system permits review of the key frames upon or after  
2 completion of execution of the video source frames.

1 50. The system of claim 44, further comprising an erasing mechanism that erases the key frames

2 from the first memory at or after completion of review of the key frames by the user.

1 51. The system of claim 50, wherein the erasing mechanism is triggered by action of the user.

1 52. The system of claim 51, further comprising a user input device, wherein the action includes  
2 the user manipulation of the user input device.

1 53. The system of claim 50, wherein the erasing mechanism is triggered when a predetermined  
2 condition has occurred.

1 54. The system of claim 53, wherein the predetermined condition includes completion of  
2 execution of the video source frames.

1 55. The system of claim 53, wherein the predetermined condition includes an elapse of a  
2 predetermined amount of time following the review of the key frames.

1 56. The system of claim 31, further comprising a second memory of the memory structure and a  
2 transferring mechanism, wherein the transferring mechanism transfers the key frames from the  
3 first memory to the second memory, and wherein the second memory includes a removable  
4 memory.

1 57. The system of claim 56, further comprising an erasing mechanism that erases the key frames

2 from the first memory after the transferring mechanism completes transfer of the key frames  
3 from the first memory to the second memory.

1 58. The system of claim 31, wherein the video frame extraction algorithm comprises a content-  
2 based method of video frame extraction.

1 59. The system of claim 58, wherein the content-based method includes a keyframe scene  
2 detection method selected from the group consisting of a Method One keyframe scene detection  
3 method, a Method Two keyframe scene detection method, a Method Three keyframe scene  
4 detection method, and a Method Four keyframe scene detection method.

1 60. The system of claim 31, wherein the video frame extraction algorithm comprises a content-  
2 independent method of video frame extraction.

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